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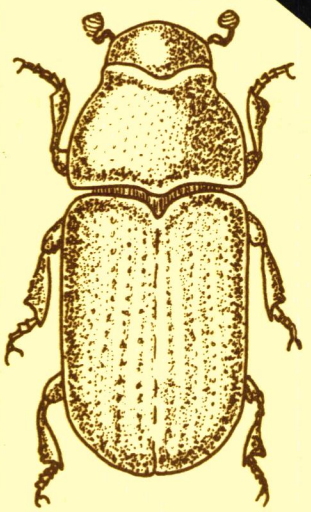
TECHNICAL REPORT R-3 76-23

SIMULATED YIELD TABLES FOR DWARF MISTLETOE MANAGEMENT IN PONDEROSA PINE STANDS (SWYLD2 PROGRAM)

Chevelon Ranger District
Apache-Sitgreaves
National Forest
Arizona

1976



Southwestern Region

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TECHNICAL REPORT

SIMULATED YIELD TABLES FOR DWARF MISTLETOE MANAGEMENT IN PONDEROSAE PINE STANDS (SWYLD2 PROGRAM)

PHASE I. YIELD TABLE SYNTHESIS: AN AID TO SILVICULTURAL PRESCRIPTIONS

Chevelon Ranger District
Apache-Sitgreaves National Forest
Arizona

April 1976

Forest Insect and Disease Management
State and Private Forestry
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INTRODUCTION

Southwestern dwarf mistletoe (Arceuthobium vaginatum subsp. cryptopodum) is the most destructive forest disease in the Southwest. This disease causes growth loss, mortality, deformity, and reduced seed production in infected trees. Timber volume yield is reduced proportionate to the level of mistletoe infestation in a stand. Silvicultural control of dwarf mistletoe is the most efficient method of reducing adverse effects of dwarf mistletoe. Removal of mistletoe-infected trees during precommercial and commercial thinning operations (as outlined in FSM 2476) is an efficient way to suppress a dwarf mistletoe infestation.

Timber volume loss resulting from a dwarf mistletoe infestation is difficult to assess by direct observation. The effectiveness of silvicultural treatments that reduce mistletoe levels are variable. Researchers have developed a simulated yield program (SWYLD2) that will aid land managers in assessing these problems (Myers, Edminster, and Hawksworth 1975). The SWYLD2 program is designed for use in even-aged or two-storied stands of ponderosa pine. Stands may be either dwarf mistletoe-infested or non-infested. Yield tables generated by the SWYLD2 program help the land manager evaluate management alternatives through examination of yields produced under such alternatives.

The SWYLD2 program is being evaluated for implementation in the Southwestern Region. Areas were selected in various parts of the Region for development of simulated yield tables in mistletoe-infested stands. The program for implementation of SWYLD2 consists of three phases: I. synthesis of yield tables for selected stands infested with dwarf mistletoe, II. evaluation of these stands managed with the aid of SWYLD2 simulations, and III. implementation of SWYLD2 in timber management programs of the Southwestern Region. This report is one of a series to be issued during the implementation process.

OBJECTIVE

The purpose of this project was to synthesize yield tables for an even-aged, dwarf mistletoe-infested ponderosa pine stand on the Chevelon Ranger District, Apache-Sitgreaves National Forest. This report summarizes results for Phase I of the SWYLD2 implementation program on this Forest.

PROCEDURE

The following procedure constituted Phase I of this project:

1. Collect data necessary for input in the SWYLD2 program from an even-aged, dwarf mistletoe-infested ponderosa pine stand on the Chevelon Ranger District.

2. Combine data with various management alternatives selected by the land manager and produce simulated yield tables for the sampled stand.

3. Assist land manager in interpreting the yield tables and selecting the best combination of management alternatives in a dwarf mistletoe-infested stand.

4. Assist land manager in planning implementation of selected management alternatives.

METHODS

A stand of even-aged ponderosa pine infested with dwarf mistletoe was evaluated in 1975 by personnel from the Forest Insect and Disease Management Staff Unit (Fig. 1). To facilitate understanding of the SWYLD2 program, an even-aged stand was sampled because use of a two-storied stand could double the number of management alternatives considered. Widely scattered overstory trees were present in the stand; however, they were not sampled because of their small number.

Sampling Procedure

1. The boundary of the area was marked.

2. Age measurements were obtained from 20 ponderosa pine trees representative of the average stand age.

3. Site index measurements were obtained from 12 dominant ponderosa pines within the area sampled.

4. Sample plots were located at 4-chain intervals along parallel compass lines 4 chains apart; the plots were of variable size with a maximum radius of 33 feet; each plot was divided into four quadrants by the intersection of a base line at right angles to the compass line; the third nearest live ponderosa pine tree (4.5 feet or taller) to plot center in each quadrant was sampled; distance from plot center to the third tree, d.b.h., and presence or absence of dwarf mistletoe were recorded for each "sample tree."1/

5. Survey data were first processed through the DENSUR computer program, which summarized field data and provided estimates of average tree density, average d.b.h., and percent of trees infected with dwarf mistletoe; the summarized data were combined with management alternatives obtained from Ranger District personnel and then processed through the simulated yield program SWYLD2.

1/ A blackjack, 4.5 feet or taller, the third nearest live tree in the sample quadrant, and within 33 feet of plot center.

RESULTS AND DISCUSSION

A 482-acre stand of even-aged ponderosa pine on the Chevelon Ranger District was sampled by collecting data on 301 plots. Area sampled, line, plot, and dwarf mistletoe distribution are indicated in Figure 2. Plots with dwarf mistletoe had at least one infected sample tree. Plots with less than two sample trees were considered understocked and were not used in the data analysis. Deletion of these plots provided a more precise estimate of density (than when they were included) for the stand to be thinned. Summation of survey results:

Site index	62
Average age	71
Average number of trees/acre	655
Average d.b.h. (inches)	5.5
Percent trees infected with dwarf mistletoe	35

This basic stand information was combined with management alternatives selected by Ranger District personnel to produce 49 simulated yield tables (generally, fewer tables will be produced). The yield tables were discussed and evaluated with Ranger District personnel. Six yield tables were selected for use as examples in this report (Tables 1-6). Several important concepts are revealed by comparing the six yield tables.

Simulated yields were projected over a 150-year rotation (Tables 2 and 3) and a 170-year rotation (Tables 1 and 4-6). A 10-year delay of the initial stand entry (Tables 3-5) resulted in increased levels of dwarf mistletoe (DMR - dwarf mistletoe rating based on 6-class system) which could not be effectively suppressed by subsequent stand entries. In some simulations (Tables 3 and 4), the merchantable volume was insufficient to meet the commercial minimum of 260 cubic feet (solid wood volume) specified by the land manager. Therefore, a commercial stand entry was not simulated. The initial thinning is generally from below (Tables 1-3 and 5), although thinning from above can be simulated (Table 4).

When the stand dwarf mistletoe rating exceeds 3.0, intermediate cuts are not executed (Table 5). A dwarf mistletoe infestation of this magnitude ($>$ 3.0 DMR) indicates a regeneration cut should be made because the reduction in wood volume caused by mistletoe is high. Regeneration of these stands is difficult because of reduced quantity and viability of seed produced by infected trees. Large increases in dwarf mistletoe levels and proportionate decreases in total timber volume are simulated for an unmanaged stand (Table 6). Reduction in total volume per acre results from dwarf mistletoe impact, as well as variations in thinning intensity, rotation age, age of initial stand entry, and method of thinning (Tables 1-5). Examination of the yield tables will aid land managers in selecting the combination of management alternatives that best meet current management objectives.

CONCLUSIONS AND RECOMMENDATIONS

Sufficient stand data were obtained on the Chevelon Ranger District for use of the simulated yield program SWYLD2. The data were combined with various management alternatives selected by Ranger District personnel, and yield tables were produced for the sampled area. Examination of yield tables by the land manager and personnel from the Forest Insect and Disease Management Staff Unit revealed several important factors: (1) volume losses caused by dwarf mistletoe can be substantial when infested stands are improperly treated (FSM 5200); (2) control of dwarf mistletoe is dependent on management alternatives selected for use in a particular area; (3) total volume production per acre is dependent on management alternatives selected for use in a particular area.

The simulated yield program SWYLD2 is a potentially useful tool for land managers. The limits of this program will be revealed after on-the-ground situations, in which simulated yield information has been used, are compared with their simulated yields.

Based on results of this report, the following plan of action is recommended for the area sampled on Chevelon Ranger District:

1. Select the yield table and accompanying management alternatives that best meet current management objectives, while reducing dwarf mistletoe to acceptable levels (FSM 5260).

2. Implement the management alternatives selected for the first stand entry.

3. At the time of initial stand entry, or within 5 years thereafter, remove all mistletoe-infected overstory trees from the treated area.

4. With the assistance of personnel from the Forest Insect and Disease Management Staff Unit, complete a post-treatment evaluation of the area.

5. Compare results of the post-treatment evaluation with simulated yield predictions (Phase II).

Instructions for use of the SWYLD2 program and detailed descriptions of management alternatives are provided by Edminster and Hawksworth (1975). Additional information pertaining to the SWYLD2 program may be obtained by contacting the Forest Insect and Disease Management Staff Unit.

LITERATURE CITED

Edminster, C. B., and F. G. Hawksworth. 1975. User's guide to SWYLD2: yield tables for even-aged and two-storied stands of southwestern ponderosa pine, including effects of dwarf mistletoe. In press.

Myers, C. A., C. B. Edminster, and F. G. Hawksworth. 1975. Yield tables for even-aged and two-storied stands of southwestern ponderosa pine, including effects of dwarf mistletoe. In press.

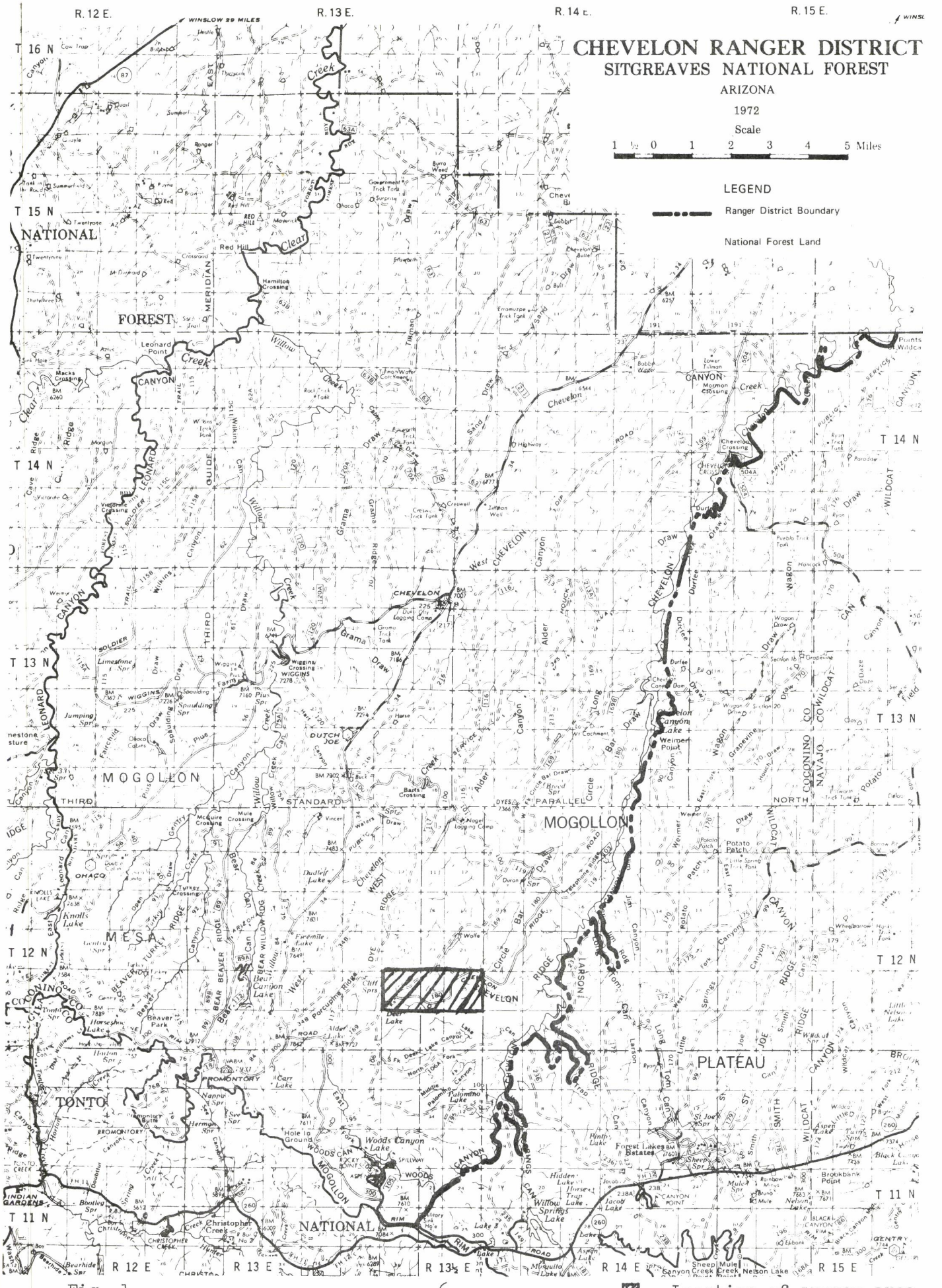
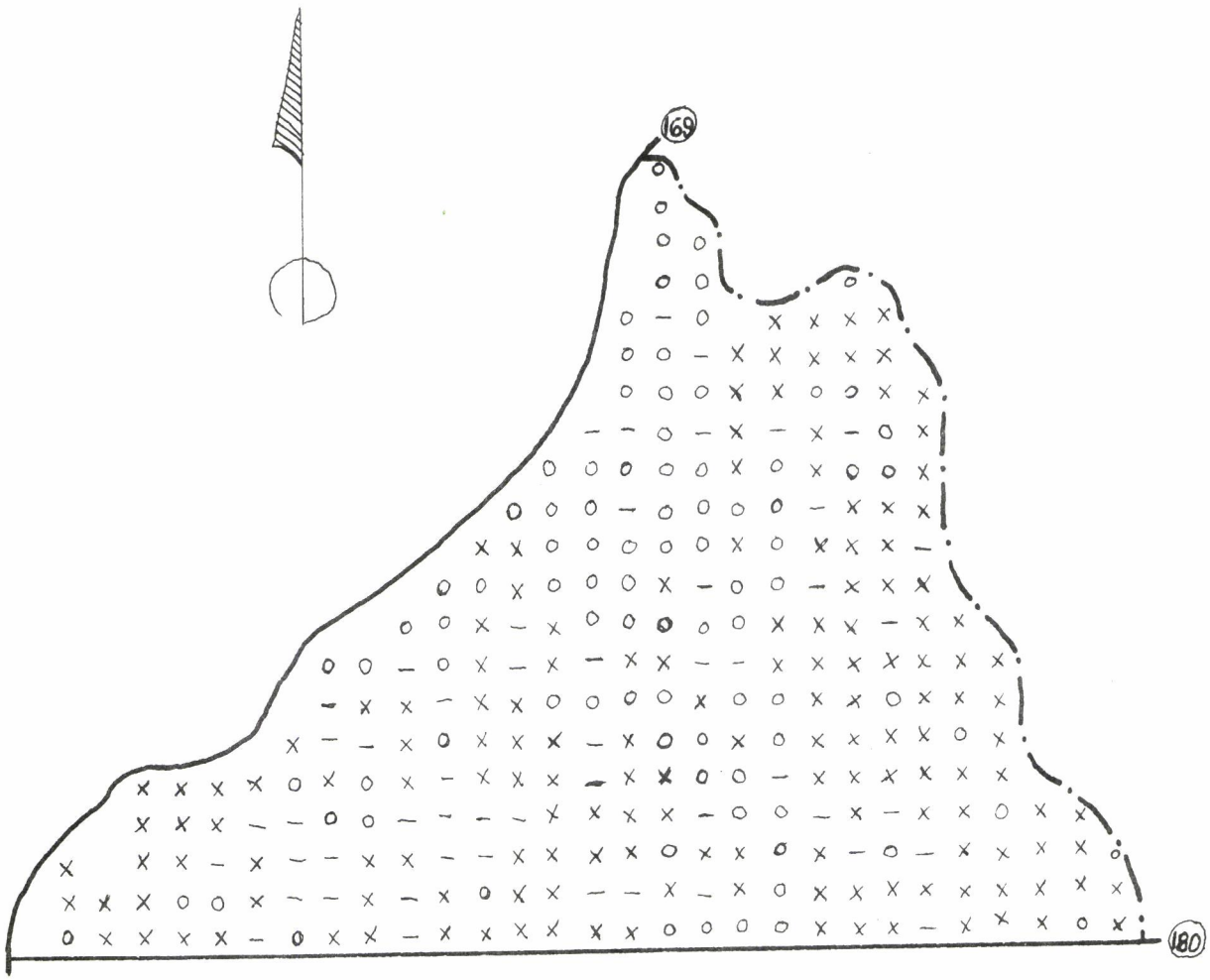


Fig. 1

▨ - Location of survey area.



301 plots
482 acres

Scale: approx. 1 cm = 8 chains

LEGEND
x Plots with dwarf mistletoe
o Plots with no dwarf mistletoe
– Understocked plots
—·— Survey area boundary
— Forest road

Fig. 2.--Dwarf mistletoe survey plot information, Chevelon Ranger District. Circle Bar Pulp Sale #1

YIELDS PER ACRE OF SOUTHWESTERN PONDEROSA PINE, STAND NUMBER 1.

SITE INDEX 62
THINNING INTENSITY-- INITIAL- 60. SUBSEQUENT- 110.

CHEVELON RD APACHE SITGREAVES NF CIRCLE BAR PULP SALE #1

		CHARACTERISTICS BEFORE AND AFTER THINNING							PERIODIC INTERMEDIATE CUTS				
STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANTABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANTABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
70	.4	655	108	5.5	49	2110	790	0					
70	.0	268	57	6.0	50	1090	550	0	367	51	1020	240	0
80	.2	286	81	7.2	56	1630	1190	0					
90	.2	284	104	8.2	60	2210	1820	1000					
90	.0	276	101	8.2	60	2150	1770	900	8	3	60	50	100
100	.1	273	121	9.0	64	2760	2390	3000					
110	.2	269	138	9.7	67	3380	3000	5800					
110	.0	202	110	10.0	68	2720	2430	5100	67	28	660	570	700
120	.1	201	128	10.8	71	3330	3030	8800					
130	.1	201	145	11.5	73	3950	3620	13400					
130	.0	145	110	11.8	74	3020	2780	9800	56	35	930	840	3600
140	.1	145	126	12.6	76	3570	3310	12200					
150	.1	145	140	13.3	78	4110	3830	14700					
150	.0	45	55	15.0	60	1660	1570	6500	100	85	2450	2260	8200
160	.1	45	65	16.3	82	2020	1920	8400					
170	.1	45	75	17.5	83	2380	2280	10600					
						TOTAL YIELDS					7500	5950	23200

MERCH. CU. FT. = TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.
BD. FT. = TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.
INITIAL THINNING MUST BE FROM BELOW.
DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED = 3.0.
MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 250. CUBIC FEET AND 1. BOARD FEET.
PRECOMMERCIAL INITIAL THINNING ALLOWED, NONCOMMERCIAL SUBSEQUENT THINNINGS NOT ALLOWED.
AT INITIAL AGE 70., 35. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

Table 1

YIELDS PER ACRE OF SOUTHWESTERN PONDEROSA PINE, STAND NUMBER 1.

SITE INDEX 62
THINNING INTENSITY-- INITIAL- 60. SUBSEQUENT- 110.

CHEVELON RD APACHE SITGREAVES NF CIRCLE BAR PULP SALE #1

		CHARACTERISTICS BEFORE AND AFTER THINNING							PERIODIC INTERMEDIATE CUTS				
STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANTABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANTABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
70	.4	655	108	5.5	49	2110	790	0					
70	.0	288	57	6.0	50	1090	550	0	367	51	1020	240	0
80	.2	286	81	7.2	56	1630	1190	0					
90	.2	284	104	8.2	60	2210	1820	1000					
90	.0	276	101	8.2	60	2150	1770	900	8	3	60	50	100
100	.1	273	121	9.0	64	2760	2390	3000					
110	.2	269	138	9.7	67	3380	3000	5800					
110	.0	202	110	10.0	68	2720	2430	5100	67	28	660	570	700
120	.1	201	128	10.8	71	3330	3030	8800					
130	.1	201	145	11.5	73	3950	3620	13400					
130	.0	57	55	13.3	75	1540	1440	5500	144	90	2410	2180	7900
140	.1	57	66	14.6	77	1930	1820	7400					
150	.1	57	78	15.8	79	2330	2220	9500					
						TOTAL YIELDS					6480	4970	18200

MERCH. CU. FT. = TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.
BD. FT. = TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.
INITIAL THINNING MUST BE FROM BELOW.
DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED = 3.0.
MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 260. CUBIC FEET AND 1. BOARD FEET.
PRECOMMERCIAL INITIAL THINNING ALLOWED. NONCOMMERCIAL SUBSEQUENT THINNINGS NOT ALLOWED.
AT INITIAL AGE 70., 35. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

Table 2

YIELDS PER ACRE OF SOUTHWESTERN PONDEROSA PINE, STAND NUMBER 1.

SITE INDEX 62
THINNING INTENSITY-- INITIAL- 60. SUBSEQUENT- 100.

CHEVELON RD APACHE SITGREAVES NF CIRCLE BAR PULP SALE #1

		CHARACTERISTICS BEFORE AND AFTER THINNING							PERIODIC INTERMEDIATE CUTS				
STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANTABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANTABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
70	.4	655	108	5.5	49	2110	790	0					
80	.9	639	147	6.5	56	3090	1940	0					
80	.0	178	50	7.2	58	1060	770	0	461	97	2030	1170	0
90	.2	177	70	8.5	63	1530	1290	900					
100	.3	176	88	9.6	67	2120	1880	3100					
100	.3	176	88	9.6	67	2120	1880	3100	0	0	0	0	0
110	.8	175	105	10.5	70	2700	2440	6200					
120	1.2	175	122	11.3	73	3290	3010	10500					
120	.8	136	100	11.6	73	2710	2490	8700	39	22	580	520	1600
130	1.2	136	116	12.5	76	3280	3040	11200					
130	.3	46	50	14.1	77	1450	1360	5400	90	66	1830	1680	5800
140	.7	46	60	15.5	80	1820	1720	7300					
150	1.0	46	70	16.7	82	2170	2070	9300					
							TOTAL YIELDS				6610	5440	16700

MERCH. CU. FT. - TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.
BD. FT. - TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.
INITIAL THINNING MUST BE FROM BELOW.
DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED - 3.0.
MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 260. CUBIC FEET AND 1. BOARD FEET.
PRECOMMERCIAL INITIAL THINNING ALLOWED. NONCOMMERCIAL SUBSEQUENT THINNINGS NOT ALLOWED.
AT INITIAL AGE 70., 35. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.
NOTE THAT NOT ALL SCHEDULED THINNINGS WERE POSSIBLE.

Table 3

YIELDS PER ACRE OF SOUTHWESTERN PONDEROSA PINE, STAND NUMBER 1.

SITE INDEX 62
THINNING INTENSITY-- INITIAL- 60. SUBSEQUENT- 100.

CHEVELON RD APACHE SITGREAVES NF CIRCLE BAR PULP SALE #1

CHARACTERISTICS BEFORE AND AFTER THINNING									PERIODIC INTERMEDIATE CUTS				
STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANTABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANTABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
70	.4	655	108	5.5	49	2110	790	0					
80	.9	639	147	6.5	56	3090	1940	0					
80	.0	225	41	5.8	54	860	390	0	414	106	2230	1550	0
90	.2	224	63	7.2	59	1340	980	0					
100	.3	223	84	8.3	62	1840	1530	800					
100	.3	223	84	8.3	62	1840	1530	800	0	0	0	0	0
110	.8	222	102	9.2	66	2420	2110	2900					
120	1.2	220	120	10.0	69	3010	2690	5700					
120	.8	176	100	10.2	69	2510	2260	5100	44	20	500	430	600
130	1.3	176	116	11.0	72	3070	2800	8600					
140	2.2	154	115	11.7	74	3150	2900	10200					
140	1.9	129	100	11.9	74	2740	2550	9000	25	15	410	370	1200
150	2.7	110	98	12.8	76	2800	2600	9700					
150	1.9	46	50	14.1	77	1450	1360	5400	64	48	1350	1240	4300
160	2.6	40	52	15.5	79	1570	1490	6300					
170	3.3	34	52	16.8	81	1610	1530	6900					
							TOTAL YIELDS				6100	5120	13000

MERCH. CU. FT. - TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.
BD. FT. - TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.
INITIAL THINNING FROM ABOVE ALLOWED IN STANDS WITH DWARF MISTLETOE.
DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED - 3.0.
MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 200. CUBIC FEET AND 1. BOARD FEET.
PRECOMMERCIAL INITIAL THINNING ALLOWED. PRECOMMERCIAL SUBSEQUENT THINNINGS NOT ALLOWED.
AT INITIAL AGE 70., 35. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.
NOTE THAT NOT ALL SCHEDULED THINNINGS WERE POSSIBLE.

Table 4

YIELDS PER ACRE OF SOUTHWESTERN PONDEROSA PINE, STAND NUMBER 1.

SITE INDEX 62

THINNING INTENSITY-- INITIAL- 110. SUBSEQUENT- 110.

CHEVELON RD APACHE SITGREAVES NF CIRCLE BAR PULP SALE #1

		CHARACTERISTICS BEFORE AND AFTER THINNING							PERIODIC INTERMEDIATE CUTS				
STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANTABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANTABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
70	.4	655	108	5.5	49	2110	790	0					
80	.9	639	147	6.5	56	3090	1940	0					
80	.2	342	89	6.9	57	1860	1290	0	297	58	1230	650	0
90	.7	339	112	7.8	62	2470	1960	0					
100	1.1	334	132	8.5	65	3020	2540	2200					
100	.7	250	106	8.8	66	2480	2130	2200	84	26	540	410	0
110	1.1	248	125	9.6	69	3140	2780	5000					
120	2.0	217	126	10.3	72	3330	3010	7300					
120	1.7	183	110	10.5	72	2930	2650	6800	34	16	400	360	500
130	2.6	156	109	11.3	75	3020	2760	9300					
140	3.5	128	102	12.1	77	2950	2720	9800					
140	3.5	128	102	12.1	77	2950	2720	9800	0	0	0	0	0
150	4.4	100	91	12.9	79	2690	2510	9400					
150	3.7	52	55	13.9	80	1650	1550	6100	48	36	1040	960	3300
160	4.5	41	52	15.2	82	1600	1520	6300					
170	5.2	31	46	16.5	84	1460	1390	6200					
							TOTAL YIELDS				4670	3770	10000

MERCH. CU. FT. = TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.
BD. FT. = TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.
INITIAL THINNING MUST BE FROM BELOW.
DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED = 3.0.
MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 200. CUBIC FEET AND 1. BOARD FEET.
PRECOMMERCIAL INITIAL THINNING ALLOWED, NONCOMMERCIAL SUBSEQUENT THINNINGS NOT ALLOWED.
AT INITIAL AGE 70., 35. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.
NOTE THAT NOT ALL SCHEDULED THINNINGS WERE POSSIBLE.

Table 5

YIELDS PER ACRE OF SOUTHWESTERN PONDEROSA PINE, STAND NUMBER 1.

SITE INDEX 62
THINNING INTENSITY-- INITIAL- 100. SUBSEQUENT- 90.

CHEVELON RD APACHE SITGREAVES NF CIRCLE BAR PULP SALE #1

	CHARACTERISTICS BEFORE AND AFTER THINNING								PERIODIC INTERMEDIATE CUTS				
STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANTABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANTABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
70	.4	655	108	5.5	49	2110	0	0					
80	.9	639	147	6.5	56	3090	1940	0					
90	1.4	608	182	7.4	63	4100	3090	0					
100	2.3	517	190	8.2	69	4570	3760	3100					
110	3.2	420	186	9.0	74	5040	4360	6400					
120	4.1	326	171	9.8	79	5010	4460	9400					
130	5.0	241	148	10.6	84	4640	4200	11700					
140	5.5	170	114	11.1	87	3680	3360	10700					
150	5.9	117	89	11.8	88	2940	2700	9600					
160	6.0-	79	68	12.6	90	2310	2150	7900					
170	6.0-	54	54	13.6	92	1880	1760	6800					
						TOTAL YIELDS					1880	1760	6800

MERCH. CU. FT. = TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.
BD. FT. = TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.
INITIAL THINNING FROM ABOVE ALLOWED IN STANDS WITH DWARF MISTLETOE.
DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED = 3.0.
MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 260. CUBIC FEET AND 1. BOARD FEET.
PRECOMMERCIAL INITIAL THINNING ALLOWED. NONCOMMERCIAL SUBSEQUENT THINNINGS NOT ALLOWED.
AT INITIAL AGE 70., 35. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

Table 6